14th Symposium on Software Performance 2023

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1 Preface

The Symposium on Software Performance (SSP) brings together researchers and practitioners interested in software performance, where "performance" is understood both in a classical sense as "the amount of useful work accomplished by a software system compared to the time and resources used", as well as in a broader sense as "the manner in which or the efficiency with which a software system reacts or fulfils its intended purpose". The scope of SSP spans measurement, modelling, benchmark design, and run-time management. The focus is both on classical performance metrics such as response time, throughput, and resource utilization, as well as on the relationship of such metrics to other software quality attributes including but not limited to scalability, elasticity, (energy) efficiency, dependability (in terms of availability and reliability), resilience, security, and privacy. Topics of interest include the design of metrics, benchmarks, and tools for quantitative system evaluation and analysis, as well as the development of methodologies, techniques and tools for modelling, measurement, load testing, monitoring, profiling, workload characterization, and run-time management of software systems with respect to the mentioned quality attributes.

The symposium is organized by the three established research groups Descartes, Kieker, and Palladio; thus this symposium also serves as a joint community meeting. Descartes is internationally known for techniques and tools for engineering self-aware computing systems designed for maximum dependability and efficiency. Kieker is a highly visible and well-established tool and approach for monitoring the software performance of complex, large, and distributed IT systems. Palladio is a likewise-established tool and approach for modelling architectures of IT systems and for simulating quality properties, such as for example performance or reliability metrics. All three tools and communities are linked by a common understanding of certain Palladio-shaped software concepts, like components and architectural models.

In this respect, it is an important date for all communities, that this year we celebrate 20 years of Palladio. We will look back at the beginnings of Palladio as a DFG Emmy Noether-Project from Ralf Reussner at Universität Oldenburg and the OFFIS institute there, and we will reflect on the current developments and plan the future of Palladio. While Palladio was the world's first simulator for architecture-based performance predictions, it is now evolving into a general platform for model-based analyses.

We solicited two types of contributions, technical papers and extended abstracts for industry or experience talks. This year's SSP program comprises 2 keynotes, 13 technical papers, and 6 extended abstracts. Submitted proposals were reviewed by a program committee with the following members:

- Dušan Okanović, Datadog
- David Georg Reichelt, Lancaster University Leipzig
- Henning Schnoor, Kiel University
- Alireza Hakamian, Universitiy of Stuttgart
- Sebastian Frank, University of Hamburg
- Martina Rapp, FZI
- Andrea Janes, Vorarlberg University of Applied Sciences
- Sören Henning, Johannes Kepler Universität Linz
- Maximilian Meißner, University of Würzburg
- Martin Sträßer, University of Würzburg
- André Bauer, University of Würzburg
- Holger Eichelberger, University of Hildesheim
- Reiner Jung, Kiel University
- Holger Knoche, ivv GmbH
- Mazimilian Walter, KIT

The organizing committee was chaired by:

- Ralf Reussner, KIT/FZI (general co-chair)
- Anne Koziolek, KIT (general co-chair)
- Robert Heinrich, KIT (program co-chair)
- Sebastian Hahner, KIT (program co-chair)
- Snigdha Singh, KIT (proceedings chair)
- Bahareh Taghavi, KIT (web chair)
- Jörg Henß, FZI (local organizer)
- Sebastian Weber, FZI (local organizer)

Currently, the steering committee comprised the following members:

- Steffen Becker, University of Stuttgart
- Wilhelm Hasselbring, Kiel University
- André van Hoorn, University of Hamburg
- Samuel Kounev, University of Würzburg
- Anne Koziolek, KIT
- Ralf Reussner, KIT/FZI

We would like to thank all committee members, the local organization team, and all participants that contributed to the event including the authors and presenters as well as our sponsors like andrena object AG, the FZI – Forschungszentrum Informatik and the Software Design and Quality Group (SDQ) at KIT.

Information about the next SSP in 2024 will be available at performance-symposium.org.

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The program comprises 13 technical papers which are part of the proceedings:

- Ahmad Alamoush and Holger Eichelberger: *Analyzing and Improving the Performance of Continuous Container Creation and Deployment*
- Bahareh Taghavi and Sebastian Weber: *A Survey of analysis Composition Operators in the context of Palladio*
- Mario Kahlhofer, Patrick Kern, Sören Henning and Stefan Rass: *Benchmarking Function Hook Latency in Cloud-Native Environments*
- Sören Henning, Adriano Vogel, Michael Leichtfried, Otmar Ertl and Rick Rabiser: *Benchmarking Stream Processing Frameworks for Large-Scale Data Shuffling*
- Lukas Beierlieb, Lukas Iffländer, Thomas Prantl and Samuel Kounev: *Comparing the Performance of Data Processing Implementations*
- Lucas Alber, Nicolas Boltz and Larissa Schmid: *Continuing to Catch Up with State of the Art Continuous Integration Pipelines in Palladio – The Experience Report Strikes Back*
- Nicolas Boltz, Maximilian Walter and Christopher Gerking: *Designing Automotive Case Studies for Architectural Security Analyses*
- Lars König and Thomas Weber: *Identifying Performance Challenges in Consistency Preserving View-Based Environments*
- David Georg Reichelt, Reiner Jung and André van Hoorn: *More is Less in Kieker? The Paradox of No Logging Being Slower Than Logging*
- Sebastian Weber and Bahareh Taghavi: *Multi-level Hardware Simulation in Palladio*
- Alexander Weber, Holger Eichelberger, Per Schreiber and Svenja Wienrich: *Performance comparison of TwinCat ADS for Python and Java*
- Martin Armbruster, Manar Mazkatli and Anne Koziolek: *Recovering Missing Dependencies in Java Models*
- Manar Mazkatli, Martin Armbruster and Anne Koziolek: *Towards Continuous Integration of Performance Models for Lua-Based Sensor Applications*

Additionally, 6 extended abstracts were accepted for presentation at the symposium:

- Sebastian Frank, Julian Brott, Levin Kerschberger, Eduard Schander, Ariane Kraus, Jens Plüddemann, Georgia König, Paul Möhring, Matthias Haeussler, Georg Rekas and André van Hoorn: *Conducting Runtime Quality Analyses using Domain Storytelling*
- Yannik Lubas, Martin Straesser and Samuel Kounev: *Generating Microservice Applications for Performance Benchmarking*
- Milad Abdullah and David Georg Reichelt: *Predicting Measurement Configuration Accuracy in Benchmarking Projects*
- Ivo Rohwer, Maximilian Schwinger, Nikolas Herbst and Samuel Kounev: *Resource Profiles of Earth Observation Workflows using Hidden Markov Models*
- Timo Dittus, Martin Straesser and Samuel Kounev: *Towards Simulation-Driven Optimization of Container Orchestration Mechanisms*
- Sebastian Frank, Julian Brott, Alireza Hakamian and André van Hoorn: *TQPropRefiner: How to Interactively Comprehend and Refine Specifications on Transient Software Quality Properties?*